

Selasphorus platycercus.—Apache City, Arizona, August. Full of fragments of insects.

Selasphorus rufus.—Apache City, Arizona, Aug. 23. Full of insect remains.

Selasphorus rufus.—Fort Huachuca, N. M. Two specimens, both partly full of insects.

Doricha evelynæ.—Rum Cay, W. I. Full of insect remains.

Basilinna xantusi.—Cape St. Lucas, Lower Cala. Stuffed. *Cecidomyia*, *Phora*, three specimens of *Solcnoopsis geminatus*, elytra of beetle, *Psyllus*, parts of spiders.

Iache latirostris.—Morelos, Mexico. Partly full.

Chlorostilbon sp. ?—Empty.

ORNITHOLOGY AT THE WORLD'S FAIR.

BY FRANK M. CHAPMAN.

WHILE the zoölogical sciences were assigned no especial place at the World's Fair in Chicago several branches are nevertheless well represented.

The larger mammals receive, in proportion to the number of species, the most attention, the exhibits ranging in size and importance from the finely mounted collections shown by the National Museum and the State of Kansas to the moth-eaten, undressed skins tacked on the wall of some exhibitor's section.

The Fish Commission of course presents an excellent economic display of piscatorial products, and the economics of entomology are well represented by the U. S. Department of Agriculture and the Illinois State Laboratory. Reptiles are exhibited in small numbers by the U. S. National Museum, while the same institution and Ward's Natural Science Establishment have exhibits of invertebrates.

In point of number of specimens probably birds are better represented than any other branch of the animal kingdom. The lack, however, of a section devoted to zoölogy makes it exceedingly difficult to learn the location of a given exhibit even after one has ascertained its existence. Thus collections of birds are displayed in many of the State and foreign build-

ings, and in the vast structures devoted to manufactures and liberal arts agriculture, ethnology, and the exhibits of the United States government.

These collections, using this word in a broad sense, may be classed under three heads: artistic or taxidermic, commercial, and scientific. The first includes exhibits by taxidermists, of which panels of game-birds shown by F. H. Lattin & Co. are probably the best. The second contains such purely commercial exhibits as eiderdown robes from Norway, and feather work from various Central and South American Republics. Here also might be placed a collection of characteristic Bogota skins shown in the building of the United States of Colombia. Other exhibits in both the preceding classes may be passed over. The third class, scientific exhibits, may be divided into four groups, Foreign, United States and Canada, General, and Government.

Foreign Exhibits.—Outside of America there are apparently only two exhibits of foreign birds.

New South Wales, prominent in almost every department of the Fair, has a small case of water birds in the Fisheries Building, and in the Manufactures and Liberal Arts Building a general collection, mounted on the branches of two trees. These birds were without labels. Japan has a small collection of mounted birds, labelled with both scientific and common names.

Of the Central and South American Republics the collection shown by Costa Rica in its own building is incomparably the best. It consists of several hundred well mounted birds bearing labels of the same character as those used by the Smithsonian Institution. The cases are excellent but the birds are rather carelessly arranged and a number of the labels were transposed. In addition to this systematic exhibit Costa Rica devotes one end of the gallery of the building to a somewhat theatric display of characteristic birds, mammals, and reptiles, with presumably natural surroundings, and a large, painted background.

One room of Guatemala's building is given to a grotto from whose crevices peer truly grotesque mammals, while stuffed birds, a part of which are labelled, are wired to the branches of neighboring trees.

Cuba has a small mounted collection of characteristic birds. Trinidad shows a mounted group of bright-colored birds, some

of which are obviously from the mainland. British Guiana has the best local exhibit of foreign mammals, but its exhibit of birds is limited to a few skins of the brighter species.

At the time of my visit several foreign departments were as yet unopened and I cannot, therefore, say whether they contained collections of birds.

United States and Canada Exhibits.—The exhibits under this head include local collections representing the avifauna of a State or Province. As a rule they are official, that is, made by authority of the State.

In this department Illinois is easily leader. Its collection, placed in the State Building, is well-mounted and the method of arrangement is one which might well be followed in the display of similar collections. As a rule a pair of each species is shown under each of the following groups: 'Common Game Birds'; 'Summer Residents throughout Illinois'; 'Winter Residents throughout Illinois'; 'Stragglers in Illinois'; 'Migrants passing through Illinois'; 'Winter Residents of Southern Illinois'; 'Summer Residents of Southern Illinois'; and similar groups from the northern part of the State. There are also excellent groups, with natural surroundings, of Wild Turkeys, Green Herons, Prairie Hens and Red Crossbills, and, in addition, a collection of the eggs of Illinois birds.

At the conclusion of the Fair this collection, nearly all of which was mounted within the brief space of eighteen months, will be removed to the Museum of the University of Illinois. It will there prove a lasting monument to the energy and ability of its preparator, the late Mr. C. F. Adams, whose death, due to overwork, occurred while he was arranging it in Chicago.

Ohio has a well-arranged collection of State birds; North Carolina and Minnesota collections of game birds.

Pennsylvania is represented by a section of the State, giving brooks, ravines, mountains, etc., with the birds and mammals of the State placed with their natural surroundings. The object of exhibits of this kind is, of course, to give at a glance an idea of the fauna of the State, but, as in the present case, the result is apt to be confusing rather than instructive. It would seem better in preparing groups of this kind not to attempt to bring all the birds and mammals of the State into a comparatively small space.

and thus, in what purports to be a natural scene, avoid producing many unnatural effects. If, instead of this, smaller groups were shown, as for example a marsh and pond with characteristic marsh, shore and water birds, a field and roadside with its Finches, etc., would they not convey a truer impression of the avifauna to the mind of the uninitiated?

The Manitoban exhibit is placed in the Manitoba building outside the Fair grounds. It contains a large number of birds mounted on trees, but without labels.

Ontario displays a smaller collection in the Ethnological building.

General Exhibits.—The natural history collections shown in the Ethnological building by Ward's Natural Science Establishment contain representatives of almost every branch of the animal kingdom, and as a whole the exhibit is the most extensive of its kind at the Fair. The collection of birds numbers several hundred specimens and includes representatives of most of the families of the class.

Under the decidedly non-committal label of "Specimens of Birds either Beneficial or Injurious to the Farmer," Brown University exhibits a smaller collection of our commoner species.

United States Government Exhibits.—The collections of birds displayed by the Government include a systematic and popular exhibit by the United States National Museum and an Economic exhibit by the Division of Economic Ornithology and Mammalogy of the Department of Agriculture.

The first is composed of the following collections and groups:

(1) A systematic collection of the leading representatives of the families of American birds with family labels, giving a general account of the range and relationships of each family, and species labels, giving the habitat of each species shown. (2) A beautifully mounted collection of the principal game-birds of the world, including most of the North American species. (3) A case of birds whose names are frequently confused as, for example, the American and English Robins, Pheasants, Partridges, Quails, etc. (4) A case of about one hundred and fifty Hummingbirds. (5) A case of some fifty Birds of Paradise. (6) A group of Domestic Fowls. (7) A dovecote with twenty-four varieties of Domestic Pigeons perched upon it. There are also excellently mounted

and designed groups, with natural surroundings, of the English Song Thrush, with a nest and young birds; Butcher Birds, with a field mouse and Dickcissel impaled on thorns; Bower-Birds, with their strangely decorated playhouse; and Ivory-billed Woodpeckers at the entrance to their nest. There are two groups of Carolina Paroquets, one showing the birds on a frosty morning feeding on their favorite 'cockle-burrs,' the other showing the interior of a hollow tree with roosting birds clinging to the side, supporting themselves by the aid of bill, feet and tail. A group of Prairie Hens represents these birds engaged in the singular 'prairie minuet,' while two groups of Ptarmigans give a fine illustration of protective coloration. In the first the birds are in the brown or summer plumage, with surroundings to correspond; in the second they are in the white or winter plumage, with snowy surroundings.

A group of Wild Turkeys occupies a space about thirty-five feet in length and shows the method of capturing these birds by means of the 'Turkey pen.' Two Flamingoes, with their truncate mud nests, constitute a unique group, while Jacanas walking over floating lily-pads show the use of their long toes. A group of nine Wild Pigeons feeding on acorns completes an exhibit which is a credit alike to those who planned and executed it. The birds are exceptionally well-mounted and the exhibit as a whole represents our best efforts in avian taxidermy.

The collection was unfortunately somewhat too crowded to show to proper advantage, and Mr. Ridgway writes me that owing to inadequacy of space he was compelled to re-pack at least one third of the collection sent to the Fair for exhibition.

As a graphic lesson in the relations of birds to man, the exhibit of the Division of Economic Ornithology and Mammalogy has probably never been equalled. Here are groups which tell their own story so plainly that the most casual observer, attracted at first by their beauty, cannot leave them without at least some knowledge of the facts they are designed to explain.

The exhibit is of two kinds, one strictly economic, the other faunal. The first illustrates the food of birds, the second their geographical distribution. The following groups of birds with natural surroundings are included in the first class: A Robin worm-hunting on a bit of lawn, attended by its ever-present

persecutor, the House Sparrow; Cedarbirds feeding on elm beetles; House Sparrows destroying peach blossoms; Bobolinks in their summer dress, and also as Reed-birds in the rice-fields in the fall; Purple Grackles taking grubs from a lawn; Crows in a field of freshly sprouted corn; Kingbirds devouring bees; and Cuckoos feeding on tussock moths.

With each group is a map showing the habitat of the species it accompanies, and a label which explains the economic relations of the bird to man.

There are also mounted specimens of Hawks and Owls and, in desk-cases, skins and colored plates of these birds, surrounded by samples of their food, as mammals, birds, insects, etc., and labels giving the results of the examination of the contents of many stomachs. The Crow is treated in the same manner, and the numerous objects displayed form a striking synopsis of the food of this omnivorous bird.

As explanatory of the manner in which birds may be induced to live near the habitation of man, models of bird-houses occupied by our more familiar birds are shown, and suggestions for encouraging the domesticity of birds are given.

The faunal exhibit of this Division contains twenty-eight large maps showing in detail the distribution of as many species, genera, or sub-genera, a relief map showing the life-zones of North America as they are defined by Dr. Merriam, and a model showing part of the Great Basin slope of the Sierra Nevada opposite Owens Lake, southern California, with the characteristic birds and mammals of the region. This model is intended especially to show the effect of climate on the distribution of life, and is so effectively arranged that it explains itself at a glance. In the foreground, at the base of the mountain, is the arid desert region of the Lower Sonoran zone, with such characteristic species as *Amphispiza bilineata*, *Geococcyx*, *Harporhynchus lecontei*, *Campylorhynchus*, and *Callipepla gambeli*. Passing upward into the sage-brush of the foothills, the Upper Sonoran zone is reached. As representative birds of this zone *Oroscoptes*, *Spizella breweri*, *Melanerpes f. bairdi*, *Chondestes*, and *Aphelocoma woodhousei* are shown. Still ascending, one comes to the Boreal zone with its conifers and, as distinctive species, *Cyanocitta s. frontalis*, *Sialia arctica*, *Picicorvus*, and

Cinclus. This zone reaches the limit of trees, beyond which, and including the snow-capped summits, is the Arctic-Alpine zone with *Leucosticte* as a representative bird.

This group is a large one and includes among mammals the jumping rats of the desert, ground squirrels of the mountains, and the woodchuck and mountain sheep of the higher altitudes. From a scientific standpoint it is doubtless the best single exhibit in zoölogy shown at the Fair.

It is quite probable that in this brief review more than one collection of birds has been overlooked. Two hundred and nine acres covered with exhibits proved as difficult 'collecting ground' as the mazes of a tropical forest, and afforded birds quite as excellent opportunities for concealment.

THE HUDSONIAN CHICKADEE AND ITS ALLIES, WITH REMARKS ON THE GEOGRAPHIC DIS- TRIBUTION OF BIRD RACES IN BOREAL AMERICA.

BY SAMUEL N. RHOADS.

WHILE examining the series of *Parus hudsonicus* at the Smithsonian Institution to determine the status of *Parus hudsonicus columbianus*, Mr. Ridgway suggested to me the desirability of a careful study of the affinities of the several members of this group described by authors. A request for specimens was made in my description of the British Columbian form of *hudsonicus* in 'The Auk' for January, 1893. No answers to this appeal were received, and after a lapse of two months I started a correspondence with several of the most prominent collectors for the loan of skins. From five of these I received, in all, twenty-five specimens, Mr. Brewster sending seventeen, Prof. J. Macoun two, Mr. K. C. McIlwraith four, Mr. A. G. Kingston one, and the Natural History Society of Toronto one. Several of my Canadian correspondents, from whom I had